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| 10/578,788 | 05/08/2006 | Arthur Boothroyd | OT11.PAU.01.US | 8698 |
| David L. Henty Myers Dawes Andras & Sherman Suite 1150 19900 MacArthur Boulevard Irvine, CA 92612 | | | | |
| EXAMINER | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/578,788

Applicant(s)

BOOTHROYD, ARTHUR

Examiner

DISLER PAUL

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-2; 4-15 are rejected under 35 U.S.C. 103(a) as being Unpatentable over Rass (US 2003/0235319 A1) and Taenzer et al. (US 7,116,792 B1).

Re claim 1, Rass disclose of the method for achieving increased directivity in listening situations where at least one microphone is embedded in a first structure and at least one microphone is embedded in a second structure, the first and the second structure being freely movable relative to each other to a distance corresponding to sound wavelengths at certain frequency (fig.1-2 wt (1,20); page 3 par[0021,0030, 0040, 0033-0034]/the microphones structures may be freely moved at different positions/distance from each other for sound directivities of frequency dependent sounds), the method comprising conveying a microphone signal from one structure to a common processing unit for the microphone signals in the other structure and successively processing the signals for achieving a dynamic directional output based on the microphone input in both structures, wherein frequency directivity is enhanced by said processing (fig.2

(28,23-24); par[0021,0027,0030-0031, 0033,0037-0039, 0040]/increase/enhance all directivities with any area in the environment for dynamic directional output and with frequency dependent sound).

While, Rass disclose of the above with directional frequency dependent sound signals for processing, However, Rass failed to disclose of the specific wherein low frequency directivity is enhanced by said processing. But, Taezer et al. disclose of a system wherein the similar concept of having the low frequency directivity is enhanced by a processing (fig.5-6 wt (52,54); col.1 line 5-21; col.6 line 45-52/mic arrays with processing to achieve low frequency). Thus, taking the combined teaching of Rass and Taezer et al. as a whole, it would have been obvious for one of the ordinary skill in the art to have modified Rass with the low frequency directivity is enhanced by said processing for improved directional sound with low frequency noise signals.

Re claim 2, the method according to claim 1, where the signal to be transmitted from one structure to another structure is delayed (fig.1 wt (23); par [0036]/signal with preprocessor may be delayed).

RE claim 4, the method according to claim 1,2 or 3, where inherently in addition the distance and the spatial position of the one

microphone is determined and conveyed to the processing unit (par[0031, 0039, 0042/distance of microphone and direction characteristic]).

Re claim 5, Rass disclose of a microphone array for achieving increased dynamic directivity in listening situations, where the array comprises at least two microphones for producing a corresponding number of microphone signals, where a first microphone is embedded in a first structure and a second microphone is embedded in a second structure, the first and the second structure being movable relative to each other to increase or decrease the distance between the first microphone and second microphones to a distance corresponding to sound wavelengths at frequency, where means are provided for conveying the signals from the first microphone and the second microphone to a common processing unit for the microphone signals, wherein frequency directivity is enhanced by said common processing unit (fig.2 (28,23-24); par[0021, 0027,0030-0031, 0033,0037-0039, 0040]/increase/enhance all directivities with any area in the environment for dynamic directional output and with frequency dependent sound and all signal sent to common processor accordingly as shared by both signals).

While, Rass disclose of the above with directional frequency dependent sound signals for processing, However, Rass failed to disclose of the specific wherein low frequency directivity is enhanced by said processing. But, Taezer et al. disclose of a system wherein the

similar concept of having the low frequency directivity is enhanced by a processing (fig.5-6 wt (52,54); col.1 lien 5-21; col.6 line 45-52/mic arrays with processing to achieve low frequency). Thus, taking the combined teaching of Rass and Taezer et al. as a whole, it would have been obvious for one of the ordinary skill in the art to have modified Rass with the low frequency directivity is enhanced by said processing for improved directional sound with low frequency noise signals.

RE claim 6, the combined teaching of Rass and Taezer et al. as a whole, further teach of the microphone array according to claim 5, where the distance between a microphone in the first structure and a microphone in the second structure may be brought to a mutual distance for facilitating directivity processing facilitating directivity processing below 1000 Hz (fig.1; par[0033,0030]).

Claim 7 , the microphone array according to claim 5, where inherently in addition means for determining the distance and/or the spatial position of the first microphone relative to the second microphone (par[0031, 0039, 0042/distance of microphone and direction characteristic]).

Re claim 8, the microphone array according to claim 7 where, in addition, there are means for conveying the position to the processing unit (par[0030],fig.2 (16,28,23)).

Re claims 9, a microphone array according to the claims 9/1-9/5, where means are provided for conveying a microphone array signal to a head-worn device, e.g. a hearing aid, where these means for conveying may comprise a Radio Frequency (RF), inductive, Infra-Red (IR), wired or other transmission link (fig.2 (16,28); par[0041]).

Re claim 10-11 have been analyzed and rejected with respect to claims 1,9.

Re claim 12, A hearing aid for use in a system as defined in claim 10, where means are provided for receiving an additional external microphone input and for conveying these to a processing unit in the hearing aid, where the processing unit is adapted to provide a directional output based on the microphone inputs (fig.2 (23,24); par[0031,0036]).

RE claim 13, the hearing aid according to claim 12, comprising a wireless receiver for receiving microphone input signals from an independent microphone unit (fig.2; par[0041]).

Re claim 14, the microphone unit for use in a system as defined in claim 10, the unit comprising at least one microphone and a transmitter for transmitting a microphone signal to a hearing aid comprising a receiver (fig.2 wt (16,28)).

Re claim 15, the microphone unit according to claim 14, comprising a wireless transmitter for transmitting microphone input signals to an independent hearing aid unit (fig.2).

2. Claim 3 is rejected under 35 U.S.C. 102(e) as being anticipated by Rass (US 2003/0235319 A1) and Taenzer et al. (US 7,116,792 B1) and Buck et al. (US 7,020,291 B2).

Re claim 3, the method according to claims 3 with directivity, wherein the microphone signal of the one structure is amplified, filtered and weight adjusted/equalized for achieving dynamic directivity (par [0025,0040],fig.1 wt (23); par[0043]). However, the combined teaching of Rass and Taenzer et al. as a whole, fail to disclose of the specific wherein the signals being attenuated and low-pass filter. However, Buck et al. disclose of a microphone signal structure wherein similar limitation the signals being attenuated and low-pass filter (fig.1 wt (filter,low pass); col.1 line 45-55) for purpose of achieving high directivity useful signal of attenuating sound emphasis. Thus, taking the combined teaching of Rass and Taenzer

et al. and Buck et al. as a whole, it would have been obvious for one of the ordinary skill in the art to have the combined teaching of Rass and Taenzer et al. as a whole, with the signals being attenuated and low-pass filter for purpose of achieving high directivity useful signal of attenuating sound emphasis.

3. Claim 16 is rejected under 35 U.S.C. 102(e) as being anticipated by Rass (US 2003/0235319 A1) and Taenzer et al. (US 7,116,792 B1) and Brennan et al. (US 6,240,192 B1).

Claim 16, the microphone array of claim 5, wherein the first structure further includes a plurality of microphones (fig.2 (11A-11C), but, the combined teaching of Rass and Taenzer et al. as a whole, fail to disclose of the specific wherein each of the plurality of microphones in the first structure has an individualized preamplifier. But, Brennan et al. disclose of a similar concept wherein each of the plurality of microphones in a structure has an individualized preamplifier (fig.1 (12); col.3 line 19-22). Thus, taking the combined teaching of Rass and Taenzer et al. and Brennan et al. as a whole, it would have been obvious for one of the ordinary skill in the art to have modified the combined teaching of Rass and Taenzer et al. as a whole, with wherein each of the plurality of microphones in a structure has an individualized preamplifier for adjusting low signal which can enable to be easily handled by the processing unit.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Disler Paul whose telephone number is 571-270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./
Examiner, Art Unit 2614

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2614